

## EXECUTIVE SUMMARY

**T**he Illinois River, described by early explorers as a “boundless marsh”, has long been characterized by the productivity of its extensive backwater and floodplain complexes. However, over time the ecological health of the system has declined significantly due to the combined effects of sedimentation, altered hydrology, and other modifications to the basin. Despite these declines, the Illinois River Basin represents one of the most productive resources in the Midwest and has high potential for restoration. The National Research Council identified the Illinois River as one of three large-floodplain river systems in the lower 48 states with the potential to be restored to an approximation of their outstanding biological past.

This post authorization change report represents a final response to the Comprehensive Plan portion of the Illinois River Basin Restoration authority provided in Section 519 of the Water Resources Development Act (WRDA) 2000 and to the Illinois River Ecosystem Restoration Feasibility Study conducted under Section 216 of the 1970 Flood Control Act as a review of the completed 9-Foot Channel Navigation Project. Section 519 also provides ongoing authority to evaluate and implement Critical Restoration Projects. This report assesses the total basin restoration needs and makes specific recommendations regarding modification of the existing authority to improve implementation. The Corps of Engineers and Illinois Department of Natural Resources (sponsor) worked together in coordination with numerous other state and Federal agencies on these two similar and complimentary studies.

This Comprehensive Plan provides the vision, goals, objectives, desired future, and recommended plan to restore the ecological integrity of the Illinois River Basin System. This plan documents the need for and scope of the four components called for in Sec 519 (b)(3): a restoration program; a long-term resource monitoring program; a computerized inventory and analysis system; and a program to encourage innovative dredging technology and beneficial use of sediments. An implementation framework and criteria are also presented to guide the identification, selection, study and implementation of restoration projects, monitoring and adaptive management activities, and further system investigations.

### SIGNIFICANCE OF THE ILLINOIS RIVER BASIN

The Illinois River’s significance was recognized by Congress in WRDA of 1986 as a “nationally significant ecosystem” as part of the Upper Mississippi River System. A 1995 report by the U.S. Department of the Interior lists large streams and rivers as an endangered ecosystem in the United States, with a documented 85 to 98 percent decline since European settlement. The Illinois River is one of a small number of world-class river floodplain ecosystems; where biological productivity is enhanced by annual flood pulses that advance and retreat over the floodplain and temporarily expand backwaters and floodplain lakes.

The predevelopment Illinois River floodplain was a complex mosaic of prairies, forests, wetlands, marshes, and clear water lakes. In the main stem river floodplain, the main channel threaded through a variety of connected and isolated backwater lakes, bottomland forests, prairies, marshes, and swamps. The productivity of the predevelopment system was demonstrated by the millions of migratory birds that stopped to rest and feed on their migrations or stopped to nest in the floodplain marshes. The fishery was reputed to be vast and exceptionally large fish catches were common. At the turn of the century, the river produced 10 percent of the nation’s catch of freshwater fish. The Illinois River system also supported more freshwater mussels per mile than any other river on the continent. The

forests supported a higher diversity of trees, many that produced fruit and seeds. Today's flora and fauna are but a remnant of these historic levels, but they still include some of the richest habitat in the Midwest, even some unique in North America.

Despite the ecological damage and degradation, the landscape and river system remain surprisingly diverse and biologically productive. The Illinois River basin is a critical mid-migration resting and feeding area of the internationally significant Mississippi River Flyway, utilized by 40 percent of all North American waterfowl and 326 total bird species, representing 60 percent of all species in North America. A survey conducted by the Illinois Natural History Survey in the fall of 1994 found that 81 percent of the fall waterfowl migration in the Mississippi flyway utilized the Illinois River. Twenty-six avian species are state listed as threatened or endangered; one of which is federally-threatened, the Bald Eagle, and four others are Federal species of concern. Many of these species are associated with wetlands or grasslands, and are also sensitive to landscape fragmentation.

The Illinois River system is home to approximately 35 mussel species, representing 12 percent of the freshwater mussels found in North America. Five mussel species are listed by the State of Illinois as threatened or endangered, one of which is a candidate for Federal listing. Fish diversity is similarly high, with 115 fish species found - 95 percent of which are native species. Many of these species require riverine, backwater, and floodplain habitat as part of their life cycle. Eighteen fish species are listed by the state of Illinois as threatened or endangered. Many of these species are endemic to the basin and/or intolerant of high silt levels. A group of aquatic organisms that is particularly representative of the Illinois River is the "Ancient Fishes" such as the paddlefish and sturgeon. The majority of these fish are migratory by nature and utilize a diversity of river habitats, flowing channel habitats, side channels, and backwater areas.

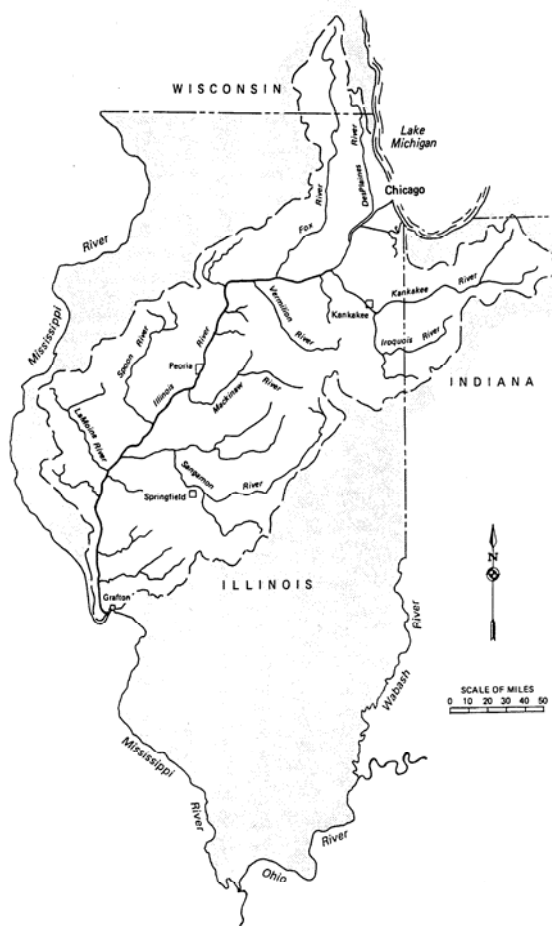
The Illinois River has long been a significant resource to the nation and the State of Illinois. It supported large Native American populations and provided a route for European explorers and settlers, and helped make the Midwest agricultural economy viable as early as the nineteenth century. This waterway provides navigation from Lake Michigan and Chicago to the Upper Mississippi River, linking the inland waterway system with the Great Lakes. In 2004, 45 million tons of commodities were transported on the Illinois Waterway. The river and its tributaries provided water for residential and industrial users and also assimilated the wastes of burgeoning metropolitan communities. In Illinois, 90 percent of the state's population, more than 11 million people, reside in the basin.

The State of Illinois has demonstrated tremendous commitment to the restoration of the Illinois River System for many years. The State of Illinois initiated, developed, adopted and implemented an *Integrated Management Plan for the Illinois River Watershed* (1997) working with multiple local, state, and Federal groups and enacted the Illinois River Watershed Restoration Act (1997). In 2000, the Governor of Illinois set the vision for Illinois Rivers 2020, a proposed \$2.5 billion, 20-year State and Federal restoration program to restore the Illinois River Basin. This plan was the first of many steps leading to the development of the goals and objectives for this comprehensive plan. In addition, Illinois leads the nation in the number of acres currently enrolled in the Conservation Reserve Enhancement Program (CREP) at 110,000 in the Federal program, and the most acres permanently protected (92 of the 73,000 acres enrolled, in the state portion of the program).

Local communities, counties, and non-governmental organizations have demonstrated commitment to the Illinois River, by implementing approximately 40 management plans calling for restoration of all or a portion of the Illinois River Basin. The Nature Conservancy and The Wetlands Initiative have both made major investments purchasing more than 11,000 acres of Illinois River floodplain and adjacent habitats for the purpose of restoration in recent years, adding to the approximately 135,000 acres already in State and Federal ownership in the basin. However, many of the restoration efforts have focused only on small components of the basin without considering the broader basin context, which is the focus of this comprehensive plan.

## STUDY AREA

The study area encompasses the entire Illinois River Basin, defined as the Illinois River, its backwaters and side channels, and all tributaries, including their watersheds (Figure 1). The entire Illinois River Basin includes 30,000 square miles (19 million acres), and includes 1,000 square miles in Wisconsin (upper Fox and Des Plaines Rivers), and 3,200 square miles in Indiana (Kankakee and Iroquois Rivers). In Illinois, the basin includes 44 percent of the land area, 46 percent of the state's agricultural land, 28 percent of its forests, 37 percent of its surface waters, and 95 percent of its urban areas.

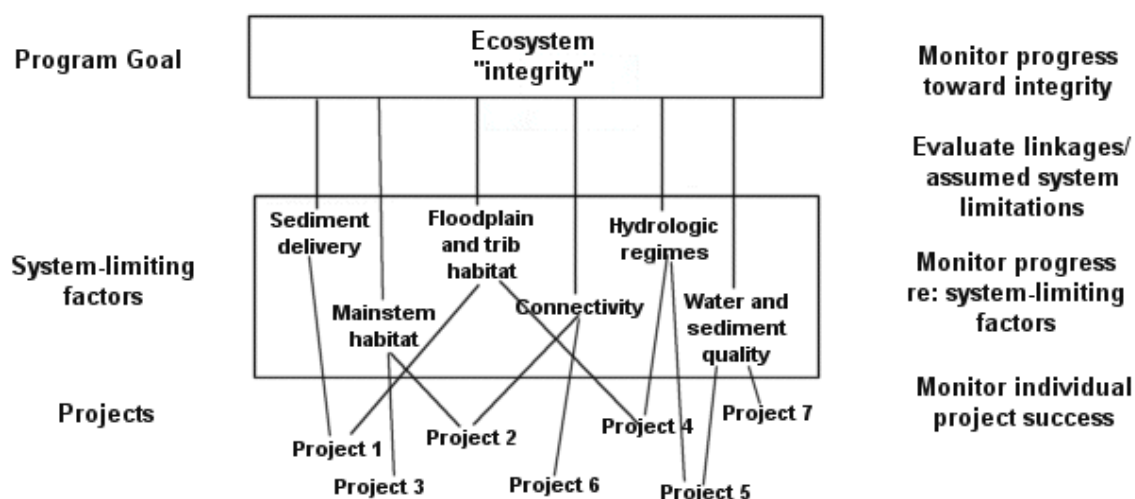


**Figure 1:** Location of Illinois River Basin

## PROBLEMS AND SYSTEM LIMITING FACTORS

The Illinois River Basin has and continues to experience a loss of ecological integrity due to sedimentation of backwaters and side channels, degradation of tributary streams, increased water level fluctuations, reduction of floodplain and tributary connectivity, and other adverse impacts caused by intensive human development over the last 150 years. While many of the original plant and animal species are still present in the basin, but at reduced levels, the physical habitats (structure) and the processes that create and maintain those habitats (function) have been greatly altered. In total, these alterations have led to a decline in the ecological health to the point where aquatic plants beds have been virtually eliminated from the lower river; macro-invertebrate numbers have declined significantly; the loss of backwaters areas with sufficient depth for spawning, nursery and overwintering habitat is now considered limiting for many native fish; and floodplain, riparian, and aquatic habitat loss and fragmentation is a threat to the population viability

of State and federally listed species in the basin. The following areas have been identified as the physical factors that limit system ecological integrity: excessive sedimentation; loss of productive backwaters, side channels, and islands; loss of floodplain, riparian, and aquatic habitats and functions; loss of aquatic connectivity (fish passage) on the Illinois River and its tributaries; altered hydrologic regime; water and sediment quality, and invasive species. There are numerous opportunities for restoration. Figure 2 illustrates how projects formulated addressing these system limiting factors collectively, can improve ecosystem integrity to the point where higher levels of function are restored. Monitoring, at both the system and individual project level, would provide the vital feedback loop needed to ensure success and increase understanding of the Illinois River Basin ecosystem.



**Figure 2:** Conceptual Model of Illinois River Basin Restoration Project and Monitoring

## VISION AND GOALS

The vision for the Illinois River Basin, accepted by the Federal, State and local stakeholders involved in the development of the Illinois River Basin Restoration Program, is:

*A naturally diverse and productive Illinois River Basin that is sustainable by natural ecological processes and managed to provide for compatible social and economic activities.*

The interagency study team developed the Illinois River Basin system wide ecosystem restoration goals and objectives in direct response to the widely identified system limiting factors. Also included are proposed measures to address the limiting factors and their expected outputs. These goal categories are interrelated and improvements in all areas are needed to substantively improve ecological integrity. As efforts are undertaken across several goal categories, the restoration activities would reverse complex, systemic declines that have degraded the system below some critical thresholds.

**Overarching Goal: Restore and maintain ecological integrity, including habitats, communities, and populations of native species, and the processes that sustain them**

**Objectives**

- A. Identify and address system wide limiting factors to ecological integrity (structure and function) described in the previous section
- B. Restore and conserve natural habitat structure and function, including, but not limited to:
  1. Concentrations of flora and fauna or areas that are high in biodiversity; especially vulnerable to disturbance; and/or important in fulfilling a life-history requirement of the species present.
  2. Specific suitable habitat for Federal and State endangered and threatened species, or other species of concern, that is capable of supporting long-term sustainable populations at the site, and protect additional acres of the identified suitable habitat, as appropriate.
  3. Representative examples of all community types in the Illinois River Basin, best of kind or as needed, to protect and restore habitat structure and function at the system level.
- C. Establish existing and reference conditions for ecosystem functioning and sustainability against which change can be measured; monitor and evaluate actions to determine if goals and objectives are being achieved, at both the project and system level.

**System Limiting Factors**

**1. Excessive Sedimentation:** Increased sediment loads from the basin have severely degraded environmental conditions along the main stem Illinois River by increasing turbidity and filling backwater areas, side channels, and islands. Similar problems can be seen throughout the basin where excessive sediment has degraded tributary habitats. The average amount of sediment delivered to the Illinois River each year is approximately 12.1 million tons; of which 6.7 million tons (55 percent) is deposited within the river, its bottomlands, and backwater lakes.

**Goal1: Reduce sediment delivery to the Illinois River from upland areas and tributary channels with the aim of eliminating excessive sediment load (Goal 1)**

**Objectives**

- A. Reduce total sediment delivery to the Illinois River by at least 10 percent by 2025 (reduction from an average of 12.1 to 10.9 million tons per year above Valley City, based on Illinois State Water Survey (ISWS) estimate of delivery for water year (WY) 1981-2000)
- B. Reduce total sediment delivery to the Illinois River by at least 20 percent by 2055 (reduction to an average of 9.7 million tons per year above Valley City, based on ISWS estimate of delivery for WY1981-2000)
- C. Eliminate excessive sediment delivery to specific high-value habitat both along the main stem and in tributary areas

**Measures:** Incising channels would be treated with rock riffle structures, if possible, otherwise using sheet-pile grade control structures. The preferred method of treating bank erosion was assumed to be stone barbs, then stone toe (see photograph 1), or finally a stone armor blanket if necessary; bioengineering was incorporated in most of the bank erosion stabilization measures. Finally, upland sediment control measures include the construction of dry basins.



**Photograph 1:** Example before and after stream restoration with stone toe protection

**Outputs:** Anticipated project outputs related to Goal 1 include: reducing sediment delivery to the Illinois River, reducing turbidity in the tributaries and Illinois main stem and backwaters, increasing the life of existing and restored backwaters as critical habitats for native species. These effects would benefit system aquatic plants, mussels, invertebrates, fish, and other native species.

**2. Loss of Productive Backwaters, Side Channels, and Islands:** A dramatic loss in productive backwaters, side channels, and islands due to excessive sedimentation is limiting ecological health, connectivity to the river, and altering the character of this unique floodplain river system. The Illinois River has lost much of its critical spawning, nursery, and overwintering areas for fish, habitat for waterbirds (including diving ducks), aquatic species, and backwater aquatic plant communities. On average, the backwater lakes along the Illinois River have lost 72 percent of their capacity.

**Goal: Restore aquatic habitat diversity of side channels and backwaters, including Peoria Lakes, to provide adequate volume and depth for sustaining native fish and wildlife communities (Goal 2)**

### Objectives

- A. Restore, rehabilitate, and maintain up to 19,000 acres of habitat in currently connected areas (1989 data shows approximately 55,000 acres of backwaters during summer low water). Restoration should result in a diversity of depths. For restored backwaters, a general target would be to have the following distributions

of depths during summer low flow periods: 5 percent >9 feet; 10 percent 6 to 9 feet; 25 percent 3 to 6 feet; and 60 percent <3 feet

- B. Restore and maintain side channel and island habitats
- C. Maintain all existing connections between backwaters and the main channel. (connections at the 50 percent exceedance flow duration)
- D. Identify beneficial uses of sediments
- E. Compact sediments to improve substrate conditions for aquatic plants, fish, and wildlife

**Measures:** The measures evaluated for backwater restoration included various configurations and levels of sediment removal and placement. For side channels and island protection, various measures were evaluated including instream structures for habitat (see photograph 2), and restoration of depth and flow.



**Photograph 2:** Example of Instream Rock Pile Structure

**Outputs:** Anticipated project outputs include immediately addressing critically limited off-channel aquatic habitat. These effects would benefit the system fish, invertebrates, aquatic plants, mussels, and other native species. At a completed side channel and backwater restoration project a comparison of pre- and post-project construction monitoring data showed a dramatic increase in the number and diversity of fish and waterfowl species as well as an increased total number of individuals. This success is anticipated for similar projects.

**3. Loss of Floodplain, Riparian, and Aquatic Habitats and Functions:** Land-use and hydrologic change has reduced the quantity, quality, and functions of floodplain, riparian, and aquatic habitats. Flood storage, flood conveyance, habitat availability, and nutrient exchange are some of the critical aspects of the floodplain environment that have been adversely impacted. Habitat loss and fragmentation are widespread problems that, in the long term, could limit attempts to maintain and enhance biodiversity. In addition, habitat forming disturbance regimes have been



altered, affecting habitat and species diversity. An analysis of the main stem Illinois River floodplain cover types reveals a loss of approximately 75 percent of the forest, 81 percent of the grassland, and 70 percent of the wetlands. In addition, nearly 50 percent of the floodplain has been isolated from the river. A similar analysis of the tributary floodplains reveals approximate losses of 16 percent of the forest, 36 percent of the grassland, and 70 percent of the wetlands. Channelization is estimated to impair approximately 1,400 miles of perennial stream within the Illinois River Basin.

**Goal: Improve floodplain, riparian, and aquatic habitats and functions (Goal 3)**

**Objectives**

- A. Restore up to an additional 150,000 acres of isolated and connected floodplains along the Illinois River main stem to promote floodplain functions and habitats
- B. Restore up to 150,000 acres of the Illinois River Basin large tributary floodplains
- C. Restore and or protect up to 1,000 additional stream miles of riparian habitats

**Measures:** Potential measures for implementation cover a wide range of practices designed to improve floodplain, riparian, and aquatic habitats, including riffle structures, channelization meandering, gated levees, wetland restoration (see photograph 3), plantings (wetland, forest, prairie), and invasive species management.



**Photograph 3:** Before and After Floodplain Wetland Restoration

**Outputs:** A healthy functioning floodplain, riparian and aquatic systems in the Illinois River Basin would result in ecological benefits due to connectivity of the river and floodplain habitats critical to the life stages of numerous native species. In addition, restored riparian and floodplain corridors provide one of the best opportunities for landscape scale restoration and connectivity of remaining resource rich areas in the highly modified Midwestern landscape, improving the viability of sensitive populations and species.

**4. Loss of Aquatic Connectivity (fish passage) on the Illinois River and Its Tributaries:** Construction of dams on the main stem and tributaries alters the temperatures, flow regime,



sediment transports, chemical concentrations, and isolates biotic communities. As a result, aquatic organisms do not have sufficient access to diverse habitat such as backwater and tributary habitats that are necessary at different life stages. Lack of aquatic connectivity (fish passage) slows repopulation of stream reaches following extreme events such as flooding, drought, and pollution and reduces genetic diversity of aquatic organisms. There are seven dams on the Illinois waterway and approximately 467 within the basin where fish passage could be implemented.

**Goal: Restore aquatic connectivity (fish passage) on the Illinois River and its tributaries, where appropriate, to restore or maintain healthy populations of native species (Goal 4)**

### Objectives

- A. Restore main stem to tributary connectivity, where appropriate, on major tributaries
- B. Restore within tributary connectivity
- C. Restore passage for large-river fish at Starved Rock, Marseilles, and Dresden Lock and Dams where appropriate

**Measures:** Fish passage can be accomplished through a variety of techniques. These options include dam removal; rock ramp on the downstream face of the dam to provide a relatively flat 3 to 5 percent gradient (see photograph 4); bypass channels; and Denil fishways, rectangular chutes or flumes with baffles extending from the sides and bottoms.



**Photograph 4:** Before and After Rock Ramp Fish Passage at a Low Head Dam

**Outputs:** The dams found throughout the Illinois River Basin block fish movement, but most dams are partially passable under some conditions. For native fish species, fish passage must be available during the appropriate times of the year or life stages, which is often not the case. Expected outputs would include improved fish access to spawning, nursery, and overwintering areas at appropriate times. Connectivity also allows for recolonization and improved genetic diversity of populations of native fish and mussels.

**5. Hydrology and Water Levels.** The biotic composition, structure, and function of aquatic, wetland, and riparian ecosystems depend largely on the hydrologic regime. The flow

regime (magnitude, frequency, duration, timing, rate of change) affects water quality, energy sources, physical habitat, and biotic interactions, which, in turn, affect ecological integrity. Historical basin changes and river management have altered the water level regime along the main stem Illinois River, stressing the natural plant and animal communities along the river and its floodplain. The most critical changes include an increased incidence of water level fluctuations, especially during summer and fall low water periods, and the lack of drawdown in areas upstream of the navigation dams. Approximately 32 significant water level fluctuations occur during the growing season, severely limiting plant germination, growth or survival.

**Goal: Naturalize Illinois River and tributary hydrologic regimes and conditions to restore aquatic and riparian habitat (Goal 5)**

**Objectives**

- A. Reduce low water fluctuations along the main stem Illinois River where possible, concentrating on the months of May through October and using pre 1900 water level records as a reference
- B. Reduce peak flows from the major Illinois River tributaries by 2 to 3 percent for 2- to 5-year recurrence storm events by 2023. This will help to reduce peak flood stages and reduce high-water fluctuations along the river. Long term, reduce tributary peak flows by at least 20 percent for these events
- C. Reduce the incidence of low-water stress throughout the basin by increasing tributary base flows by 50 percent
- D. Remove the dramatic water level fluctuations associated with the operation of wicket dams at Peoria and La Grange
- E. At an appropriate resolution (approximately 1 square mile in urban areas, 10 square miles in rural areas) identify and quantify the land and drainage alterations that contribute to unnatural fluctuations and flow regimes
- F. Draw the pools at Peoria and La Grange down for at least 30 consecutive days at least once every 5 years

**Measures:** Reducing peak flows and increasing base flows on the tributaries will be accomplished by increasing the volume of storm water storage in the watershed (through the use of various measures including: tile management, detention structures, and extended riparian areas) and directing storm water runoff to areas where it can infiltrate the soil and recharge groundwater (through the use of various measures including: tile management, filter strips, and grassed fields enclosed with a berm). Many of the detention and riparian areas will function as wetlands. Reducing fluctuations on the mainstem will be accomplished through the following measures including: performing pool drawdowns (see photograph 5), installing automated dam gates, and installing new gates at existing dam sites were evaluated.



**Photograph 5:** Before and After Pool Drawdown in Backwater Area

**Outputs:** In regard to tributary flows, regimes with reduced peaks and increased baseflows would provide more desirable levels of ecosystem function than currently occur. Within the tributaries, improved aquatic species survival is anticipated including, fish and macroinvertebrate populations. Like the tributary systems, two types of benefits were identified for the main stem: reduced fluctuations and area exposed by drawdown. In particular, the reductions in sudden water level rises in the summer is considered a critical element in restoring aquatic plant populations and reductions in rapid winter drops would protect native fish and other aquatic organism populations.

**6. Water and Sediment Quality.** Water clarity is the primary factor limiting submersed aquatic plants. During periods of high turbidity, aquatic plant growth is limited, since suspended sediments interfere with light penetration into the water. In addition to turbidity, the quality of the sediments, particularly in the main stem, may limit macroinvertebrates such as fingernail clams. Water resources in the Illinois River Basin are also impaired due to a combination of point and non-point sources of pollution.

**Goal: Improve water and sediment quality in the Illinois River and its watershed  
(Goal 6)**

**Objectives**

- A. Achieve full use support for aquatic life in all surface waters, as defined in 303(d) of the Clean Water Act, of the Illinois River Basin by 2025
- B. Achieve full use support for all uses on all surface waters of the Illinois River Basin in 2055
- C. Encourage remediation of sites with contaminant issues that affect habitat
- D. Achieve USEPA nutrient standards by 2025, following standards to be established by 2008
- E. Work to minimize sedimentation as a cause of impairment as defined by 305(b) of the Clean Water Act by 2035
- F. Maintain waters that currently support full use.

**Measures:** Separate measures were not identified for the sole purpose of water and sediment quality restoration. However, benefits would result from reductions in sediment, nutrient processing in restored floodplain and riparian areas.

**Outputs:** It is expected that water quality would continue to improve somewhat in the future because of improved waste and storm water treatment practices and local conservation efforts, and that improved water quality would translate into improvements in other ecosystem components. However, future gains would be less dramatic than in the past without also working on the other limiting factors.

## PLAN FORMULATION

Eight alternative plans (including the No Action alternative) were formulated to provide a range of restoration options for consideration in addressing the system limiting factors to restore ecosystem structure and function. All alternatives, except the No Action alternative, would reduce anticipated future degradation. While the smaller scale alternatives would include focused efforts to provide regional habitat and regional ecological integrity benefits over the 50-year planning horizon, the larger scale alternatives would provide improvements in overall basin ecological integrity. In addition to restoration planning and implementation, all alternatives included a Technologies and Innovative Approaches Component and management costs. The Technologies and Innovative Approaches Component addresses the other components called for in Section 519: development and implementation of dredging and beneficial use technologies; long term resource monitoring; and a computerized inventory and analysis system.

Alternatives were formulated in coordination with State and Federal agencies to address the total additional restoration needs beyond the existing and expected future without project restoration funding levels. Based on the assessment of key evaluation criteria, Alternative 6 was selected as the preferred alternative. If fully implemented over the next 50 years, it would cost approximately \$8 billion and provide measurable increases in system ecological integrity and sustainability over the without project condition. The Comprehensive Plan was formulated to address system restoration needs and was not specific to Corps of Engineers and Illinois Department of Natural Resources activities. As a result, the total restoration costs include a relatively large portion of work for other agencies. The process of identifying agency missions and programs has been initiated and documented in Section 6. The process of full multiple agency implementation will continue to develop over the initial years of the program.

Alternative 6 includes:

- Reducing systemic sediment delivery by 20 percent
- Restoring 12,000 acres of backwaters
- Restoring 35 side channels
- Protecting 15 islands
- Restoring 75,000 acres of main stem floodplain
- Restoring 75,000 acres of tributary floodplain and riparian areas
- Restoring 1,000 stream miles of aquatic habitat
- Providing fish passage along the Fox, DuPage, Des Plaines, Kankakee, Spoon, and Aux Sable Rivers

- Producing an 11 percent reduction in the 5-year peak flows in tributaries
- Increasing tributary base flows by 20 percent
- Reduce water level fluctuations along the main stem during the growing season by 66 percent
- Providing system level improvements in water quality

In total, this plan would provide benefits to approximately 225,000 acres and 33,000 stream miles. This alternative would achieve approximately 63 percent of the desired future conditions. Fully implemented, the anticipated benefits of Alternative 6 include reaching a number of key thresholds that are currently limiting ecological integrity. These include:

- Reducing water level fluctuations and turbidity to levels that allow for reestablishment of aquatic plants beds in the Illinois River
- Increase macro-invertebrate numbers as a food base for the system
- Increased depth diversity in backwaters areas providing spawning
- Nursery and overwintering habitat for native fish and habitat for the return of diving ducks
- Increased connectivity of riparian and aquatic habitats providing improved species and population viability of State and federally listed species

A tiered restoration program implementation is proposed for the Corps of Engineers participation, based on the scope of restoration activities in the 30,000 square mile basin and the uncertainties regarding funding for the other agencies. Tier I would involve an initial \$153.85 million of effort (\$100 million Federal) through roughly 2011. This timing would coincide with the proposed writing of a Report to Congress describing the accomplishments of the program and any needed adjustment to improve effectiveness. Tier II would address further restoration activities up to a total of \$384.6 million (\$250 million Federal) through 2015. Additional tiers would address remaining restoration needs. The timing and funding levels for further tiers can be refined based on increased understanding of system responses to the initial restoration projects and consideration of further developments regarding interagency funding and partnerships.

## **DESCRIPTION OF THE RECOMMENDED 2011 PLAN**

The recommendation calls for continuing restoration efforts under the existing authority of Section 519. Initial Tier I restoration efforts with the first \$153.85 million through 2011 are described below and would begin significant restoration consistent with eventual implementation of Alternative 6 (Tentatively Selected Plan). This initial phase is proposed to demonstrate the benefits of the various practices and project components prior to seeking additional funds. These restoration efforts would focus on the upper watershed and in particular the Peoria Pool and tributaries and Kankakee River. These are two of the high value resource areas, and due to their location in the upper reaches of the basin, have potential to more rapidly demonstrate the effectiveness of the various projects.

These efforts would be cost shared 65 percent Federal (\$100 million) and 35 percent non-Federal (\$53.85 million). This funding level would provide approximately \$127.0 million for planning, design, construction and adaptive management of critical restoration projects; \$24.1 million for the technologies and innovative approaches component; and \$2.75 million for system management. The estimated annual Operation and Maintenance cost, once all features are in place, is \$125,000.

If funding is available a report to Congress will be submitted in the 2011 time frame, documenting the project successes and the results from Tier I efforts.

The following sections describe these aspects of the initial restoration efforts in greater detail. Funding would address three major areas with funding at approximately the level indicated.

**Restoration Projects.** The majority of the funding, roughly 82.5 percent or \$127.0 million (including \$7.75 million in adaptive management if required) of the initial \$153.85 million, would be targeted to address component (b)(3)(B) of Section 519 (WRDA 2000) calling for the development and implementation of a program to plan, design, and construct restoration projects. While all goal categories are important and would be addressed to some extent in efforts through 2011, initial activities will emphasize the most critical restoration issues: reduce sediment delivery (Goal 1), restore side channels and backwaters (goal 2), and reduce water level fluctuations (Goal 5). The following priority areas will be addressed initially, with potential for more depending on actual costs/availability of funds.

- Small Watersheds – 8 watersheds
- Major Tributaries – two reaches
- Mainstem – three backwaters, four side channels and islands, and one floodplain

Included in the restoration projects will be the sixteen critical restoration projects identified to date. These include eight small watershed projects: Waubonsie Creek, Senachwine Creek, Crow Creek West, Tenmile Creek, Yellow River, Iroquois River, Blackberry Creek, and McKee Creek; two major tributary projects on the Kankakee River and Fox River; and seven main stem projects, including backwater restorations, Peoria Riverfront – Upper Island and Pekin Lake – Southern Unit, and a main stem floodplain restoration at Pekin Lake – Northern Unit, and side channel and island projects in Starved Rock, LaGrange, and Alton Pools.

Based on the large study area, complexity of the ecosystem restoration, and the opportunities for increased cost effectiveness, adaptive management is recommended to be included within restoration funding.

**Technologies and Innovative Approaches Component.** Approximately 15.7 percent or approximately \$24.1 million of the \$153.85 million authority would be utilized to conduct a Technologies and Innovative Approaches Component to address the other three components called for in Sec 519 (b)(3): a long-term resource monitoring program; a computerized inventory and analysis system; and a program to encourage innovative dredging technology and beneficial use of sediments. Monitoring is particularly important due to the complexity and scale of the Illinois River Basin; feedback from monitoring efforts will be necessary to determine if adjustments are needed to the goals and restoration approaches to maximize the cost effectiveness of activities. The outputs of all monitoring efforts will be closely coordinated with project teams and adaptive management efforts to maximize the effectiveness of restoration activities.

- 1) System Level and Goal Level Monitoring: Estimated cost - \$12.5 million
- 2) Project Level Monitoring: Estimated cost - \$8.7 million
- 3) Computerized Inventory and Analysis (CIA) System: Estimated cost - \$960,000
- 4) Special Studies: Estimated cost - \$2 million
- 5) Innovative Sediment Removal and Beneficial Use Technologies: Funding would be drawn from special studies or incorporated in construction activities



**System Management.** Approximately 1.8 percent or \$2.75 million of the \$153.85 million authority would be utilized to manage the restoration efforts. Management funds would include funding for both the Corps of Engineers Districts and non-Federal Sponsors for project management and coordination activities.

## **IMPLEMENTATION STRATEGY**

An implementation framework for the Illinois River Basin Restoration study will guide the actions taken to achieve the system study recommendations. The system formulation developed the restoration vision, goals, objectives, and level of restoration effort identified in the recommended plan. The implementation framework provides the organizational structure to oversee: identification, selection, study and implementation of restoration projects; monitoring and adaptive management activities; and further system investigations.

The plan implementation process specifically addresses how activities proposed for funding through the Corps of Engineers would be conducted. However, the approach of utilizing multi-agency regional teams to review project submissions and the involvement of higher level staff from other agencies in an Illinois River Basin Steering Committee will provide a sound basis for the matching of proposed restoration with the authorities and funding of various agencies.

The proposed assessment and implementation process seeks to create a systemic, comprehensive approach that is transparent and accessible to project partners and stakeholders. The ecological merits of proposed projects will be the most important factor. Other factors to be considered will include goal-specific factors, presence of threats, sustainability, public interest and acceptability, and administrative issues. It is important to emphasize that project implementation will not proceed rigidly in strict order of numerical rankings. Flexibility is essential, and the Corps of Engineers, working with the sponsor, in consultation with the program partners, will need to exercise reasonable judgment to resolve unexpected issues, respond to opportunities, and ensure efficient program execution. Due to the watershed approach being taken during implementation, regulatory agencies will be included in assessment and feasibility phases to better identify areas of concern.

## **RECOMMENDATIONS**

It is recommended that the Illinois River Basin Restoration Program, authorized in Section 519 of WRDA 2000, be continued and expanded to more fully address the restoration needs of this nationally significant resource. Corps of Engineers cost shared restoration efforts would begin with \$153,850,000 (\$100,000,000 Federal funds) in restoration funds through 2011 (Tier I) with the potential to expand to \$384,615,000 (\$250,000,000 Federal funds) in restoration efforts through 2015 (Tier II). The funding and activities would begin significant restoration consistent with eventual implementation of Alternative 6 (Tentatively Selected Plan). These initial phases are proposed to demonstrate the benefits of the various practices and project components prior to seeking additional funding.

Tier I efforts would be cost shared 65 percent Federal (\$100 million) and 35 percent non-Federal (\$53.85 million). This funding level would provide approximately \$127.0 million for planning,

design, construction and adaptive management of restoration projects; \$24.1 million for the technologies and innovative approaches component; and \$2.75 million for system management. The estimated annual Operation and Maintenance cost, once all features are in place, is \$125,000. If funding is available a Report to Congress will be submitted in the 2011 time frame, documenting the project successes and the results from Tier 1 activities.

The current authorization provides ongoing authority to evaluate and implement Critical Restoration Projects. It is recommended that the Illinois River Basin Restoration Program, authorized in Section 519 of WRDA 2000, be modified to more fully address restoration needs of this nationally significant resource. These recommendations were developed in cooperation with the State of Illinois Department of Natural Resources, other Federal and State agencies, local governments, and various non-governmental organizations.

**Recommended Amendments to Section 519 of the Water Resources Development Act (WRDA) of 2000, Public Law 106-541:**

- A. That the per project Federal cost limit for Critical Restoration Project be increased from \$5 million to \$20 million. Increasing the per project cost limit would allow implementation of a wider range of critical restoration projects more directly matching the scale identified in the Comprehensive Planning efforts. Without modification many larger projects could not be implemented as effectively or at all.
- B. That the current authorization for Critical Restoration Projects be expanded to more fully address component (b)(3)(B) calling for the development and implementation of a program for the planning, conservation, evaluation and construction of measures for fish and wildlife habitat conservation and rehabilitation, and stabilization and enhancement of land and water resources in the Basin. Replace the specific criteria for Critical Restoration Projects found in Section 519, with a requirement that restoration projects be identified following an implementation framework and inter-agency coordination. Individual critical restoration projects may involve restoration activities at several non-contiguous locations within a pool or sub-watershed.
- C. That authorization for implementation of a Technologies and Innovative Approaches Component be provided as a complement to the Critical Restoration Project activities. Activities would include initiatives called for in Section 519 (b)(3)(A) development and implementation of dredging and beneficial use technologies; (C) long term resource monitoring; and (D) and a computerized inventory and analysis system.
- D. That authorization be provided allowing the development of cooperative agreements and fund transfers between the Corps of Engineers and the State of Illinois: scientific surveys at the University of Illinois; and units of local government: counties, municipalities, and Soil and Water Conservation Districts to facilitate more efficient partnerships.
- E. That authorization be provided that the Chief of Engineers may enter into cooperative agreements with the Natural Resources Conservation Service for services to be performed by contract, grant or agreement, or by any other instrument or resource available to and consistent with the authorities of the Natural Resources Conservation Service.

- F. That the authorization be expanded to allow non-profit organizations to serve as sponsors and sign PCAs for restoration projects implemented under the Illinois River Basin Restoration program. Notwithstanding Section 221 of the Flood Control Act of 1970 (42 U.S.C. §1962d-5b), for any Illinois River Basin Restoration project carried out under Section 519 (c) of the Water Resources Development Act of 2000, a non-Federal interest and sponsor may include a non-profit organization, with the consent of the of the affected local government.
- G. That the Secretary of the Army, in consultation with the State of Illinois, submit a report to Congress every 6 years describing the accomplishments of the programs and any needed adjustment. Submittal of this report is to be timed to allow consideration as part of a comprehensive Water Resources Development Act.